Autopilot FAQ

Q: What is Trimble's Field Manager Display?
A: The Field Manager is the newest Autopilot display from Trimble. It is Ag Leader hardware (Insight) but the firmware is designed by Trimble. The firmware is specific to the display. The Field Manager and Insight cannot have the others firmware. Ag leader firmware will not work on the Trimble display and vice-versa. At this time, the Field Manager is only capable of being used with Autopilot. It is only capable of a swath based map, no rate logging.

Q: What is the Nav Controller?
A: The Navigation (Nav) Controller is Trimble's "brains" of the operation for Autopilot. This houses the circuitry that controls the system. It also houses 3 gyros and 3 accelerometers for terrain compensation, Roll, Tilt, and Yaw (T3). The internal components are solid-state electronics; meaning, there are no moving parts to wear out or fail.

Q: How does the Insight connect to the Nav Controller?
A: The Insight connects to the Nav Controller wiring harness with one connection. A null modem cable (pn: 2000819) is required and included with all new Insight monitor kits.   On Trimble's side, there is a display cable (54612) that connects to the display cable on the Nav Controller and switches that from a 12-pin deutch to a 9-pin serial for connection to a monitor.

Q: What model Nav Controllers will the Insight connect to?
A: The original Nav 1 Controller (Big Foot - Black Box) will connect to the Insight version 2.0 or higher. The Nav 1 has to be on version 3.4 or higher. The Nav 2 Controller (Ceres – Silver Box) will also connect the Insight version 2.0 or higher; the Nav 2 also needs to be on version 3.4

Q: Can the Nav Controller be used with factory-installed systems such as AFS Accu-Guide?
A: Yes, the Trimble Nav II controller can be hooked into the factory installed electro-hydraulic components and can use the Insight as a display instead of the factory display.
With the Trimble Nav II controller, the Case version of the Nav II cannot be reflashed with Trimble firmware and the Insight cannot be used as the display with Case Accu-Guide Nav II. The fix for this is to order the Case system without the Case Nav controller and replace that with the Trimble Nav II controller. Then the Insight can then be used as the display.

Q: What is Trimble's Hybrid Kit?
A: Case New Holland and Trimble have developed a kit that will allow the customer to order the new tractor Accu-Guide ready (Case) or Intelli-Guide ready (New Holland). The customer will then get a Hybrid kit from Trimble that will allow then to use the factory installed sensors with the Nav II Controller and display. The Hybrid kit includes the Nav II, Display (or use Insight), Display cable, GPS Receiver, and SonAlert.

Q: Can the Nav Controller be used with factory-installed systems such as John Deere's Autotrac?
A: Yes, the Nav controller can be hooked into the factory installed electro-hydraulic components and can use the Insight as a display instead of the factory display.   However, with the Deere system, Trimble requires installing an additional steering sensor on the front axle. Trimble does not feel that the Deere sensor is accurate enough.

Q: Can the EZ-Guide Plus be used to control the Autopilot system?
A: Yes, the EZG+ can be used to configure the Autopilot system, engage it on the patterns, store AB and curve lines and store vehicle configurations. The EZG+ internal receiver can be used, or it can accept and external signal from the 5100 for example. The EZG+ keypad has a dedicated engage button for Autopilot. The EZG+ can also output a roll corrected signal from the Nav controller through the lightbar to a monitor for mapping.

Q: What type of GPS does the Autopilot system need to operate?
A: The GPS 5100 (Trimble 252) is the only receiver that Ag Leader sells that will provide a fast enough signal (baud and hertz rate) for the Autopilot system.

Q: What correction sources can be used with Autopilot?
A: WAAS and Beacon differential can be used. Omnistar VBS, XP and HP signals are available, but for +/- 1" accuracy, an RTK system must be used.

Q: How accurate are the Omnistar Signals?
A: Both XP and HP require about the same convergence and re-convergence times. HP has hour-to-hour accuracy of +/- 2-3 inches; XP has hour-to-hour accuracy of +/- 2-3 inches. Pass to pass is +/- 1-2 inches for both XP & HP. HP long-term accuracy is 95% of 2-3 inches. XP long-term accuracy is 95% of 4-6 inches.

Q: What are the speed limitations of the Autopilot?
A: Autopilot can provide guidance at speed as low as 0.2 mph and as high as 22 mph.

Q: What is Pass-to-Pass accuracy?
A: Pass-to-Pass measures the relative accuracy over a 15-minute period, generally the length of time from one pass to the next in a given field.

Q: What is Year-to-Year accuracy?
A: Year-to-Year accuracy is a measure of repeatable accuracy that you can drive the same rows a day, week, month or year later. So, a +/- 1-inch accuracy means you can come back a year later and drive the same tracks within one inch.

Q: What is controlled Traffic?
A: Controlled Traffic allows the operator to travel down the same wheel tracks, as he moves throughout the season. For example, if you were to plant with a 30' planter and then return with a 90' sprayer, you would be able to drive every third set of tracks that you planted on.

Q: Do implement offsets get sent to the Nav controller?
A: Yes, implement offsets do get sent to the Nav controller, but GPS offsets do not. If you enter in a GPS offset, it will offset the map on the Insight, but will not send that to the Nav controller.

Q: What is Autopilot?
- Trimble AgGPS Autopilot is a highly integrated GPS based control system for the farm tractor that is capable of steering the tractor about a straight line at better than +/- 1 inch.
- 100% of the components used for Autopilot are designed and manufactured by Trimble.
- Autopilot will steer the tractor on any number of lines parallel to the initial A-B line without cumulative errors or drift.
- A-B lines can be created in the field using the tractor system, or using hand held GPS, or in the office from Latitude and Longitude data.
- The operator can Reset Point A to make the final pass on a field when there are less rows to complete or to keep rows on adjacent fields parallel to one another.
- Autopilot is based on the stand-alone AgGPS 214 RTK GPS receiver, which has a horizontal accuracy of better than 0.39 inches and a vertical accuracy of better than 0.78 inches.
- Autopilot can operate on as few as 4 visible GPS satellites.
- Autopilot uses solid-state gyros and accelerometers for precise tractor attitude compensation.
- Information from the RTK GPS receiver used on Trimble Autopilot, which is capable delivering position updates 20 times per second, is combined with inertial measurements taken by multiple gyros and accelerometers.
- The Autopilot Navigation Controller has no moving parts or cooling fans because they are not necessary.

- Modular design allows for easy upgrades, addition of new components changes in configuration, and software updates all from one manufacturer.
- Once Autopilot has been calibrated, the operator is not required to make adjustments as the tractor warms up or as field conditions change, accuracy is maintained.
- Autopilot system is installed in parallel with tractor steering system, hence is transparent until it is engaged
- Takes on average 1-2 minutes from turn on until Autopilot is ready for operation.
- Moving the steering wheel can disengage Autopilot.
- Dead man alarm puts tractor in a turn if not acknowledged by the operator.
- End-of-row alarm notifies operator when it is time to take control to turn the tractor.
- Autopilot can be engaged at any time after the A-B line has been set and it will automatically steer to the closest swath.

Q: What does Autopilot do?
- Straight parallel rows with no guess row for optimum utilization of leveling, tillage, bed preparation, planting and harvest equipment.
- Steering in forward or reverse simply by shifting the transmission, are no buttons for the operator to have to push.
- Autopilot is a tool that makes the operator's job easier and more productive.
- Multiple tractors in the same field working the same pattern.
- Autopilot automatically selects the next pass in the field; the operator does not have to press any buttons.
- Accuracy on consecutive trips through the field, bed preparation, planting, and cultivating on the same A-B line.
- During bed preparation, pull one extra bed accurately by using the entire implement width and no shovel overlap.
- Operate in low visibility conditions due to dust, fog, and at night.
- Control traffic in the field by following the same A-B line to reduce soil compaction.
- Record field operations for later play back and review.
- Allows the operator to concentrate on other in-field operations, improving work quality, productivity, and efficiency.
- The modular design of Autopilot is deliberate; because Trimble follows a policy of continuous product improvement, Trimble products are easy to upgrade and can expand to meet the grower's future needs.
- Autopilot leverages extensive product development in the areas of high accuracy machine control, field mapping, variable rate application, and data processing.
- Repeatable, reliable steering accuracy that does not drift over time.
- Autopilot's steering solution is derived by blending both RTK GPS and inertial position measurements to steer the tractor.
- Autopilot can maintain accuracy pulling wider implements at higher field speeds, more accurately than an operator can manually.
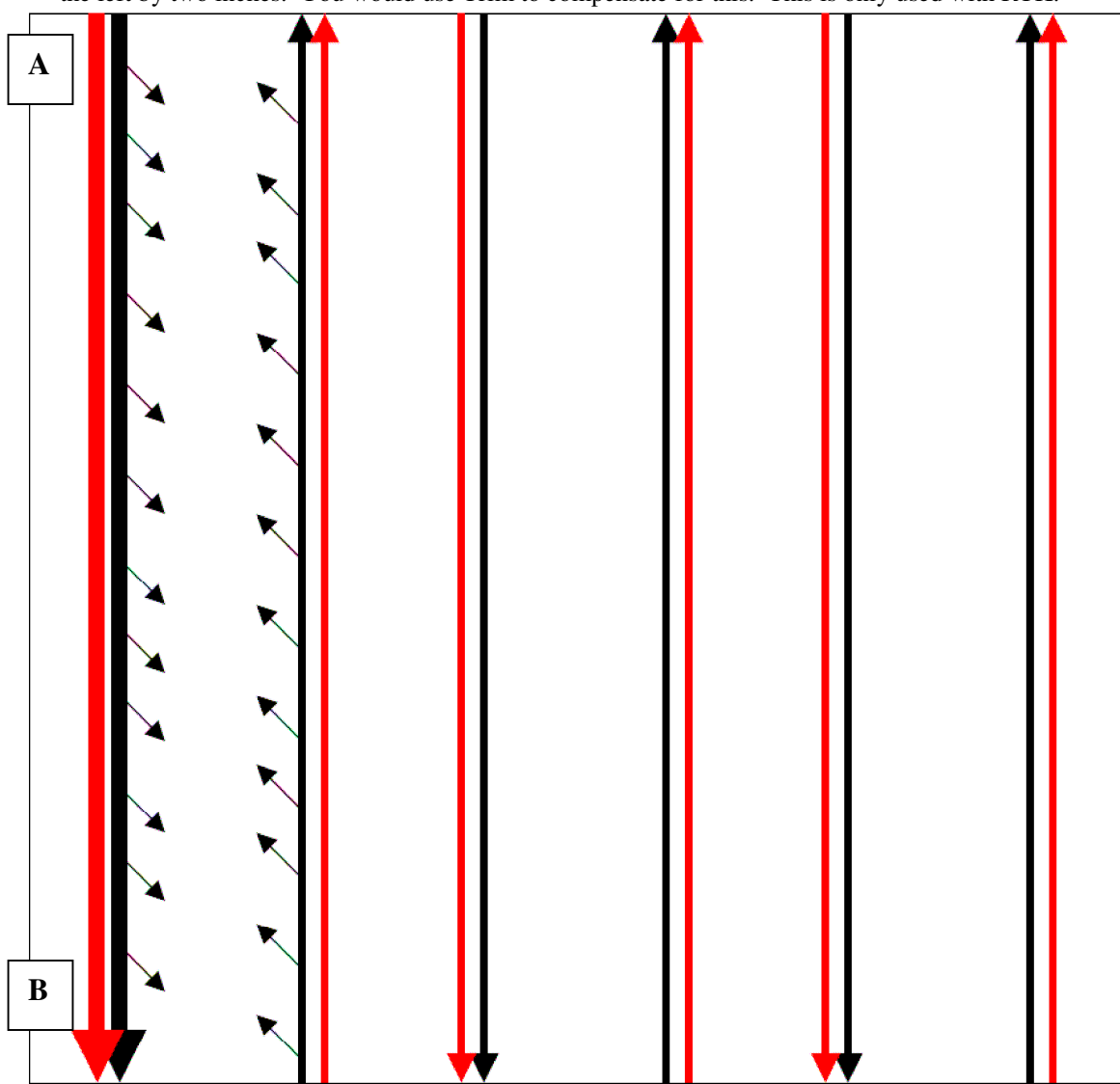
Q: What is Nudge?

A: Nudge is used with DGPS to move your existing line should you need to leave the field, get rained out, etc. Due to errors in DGPS that occur over time, the line is no longer where it needs to be with nudge, it shifts the line to the right or the left in one inch increments. Nudge does not create new AB lines and cannot be saved. This is not used with RTK.
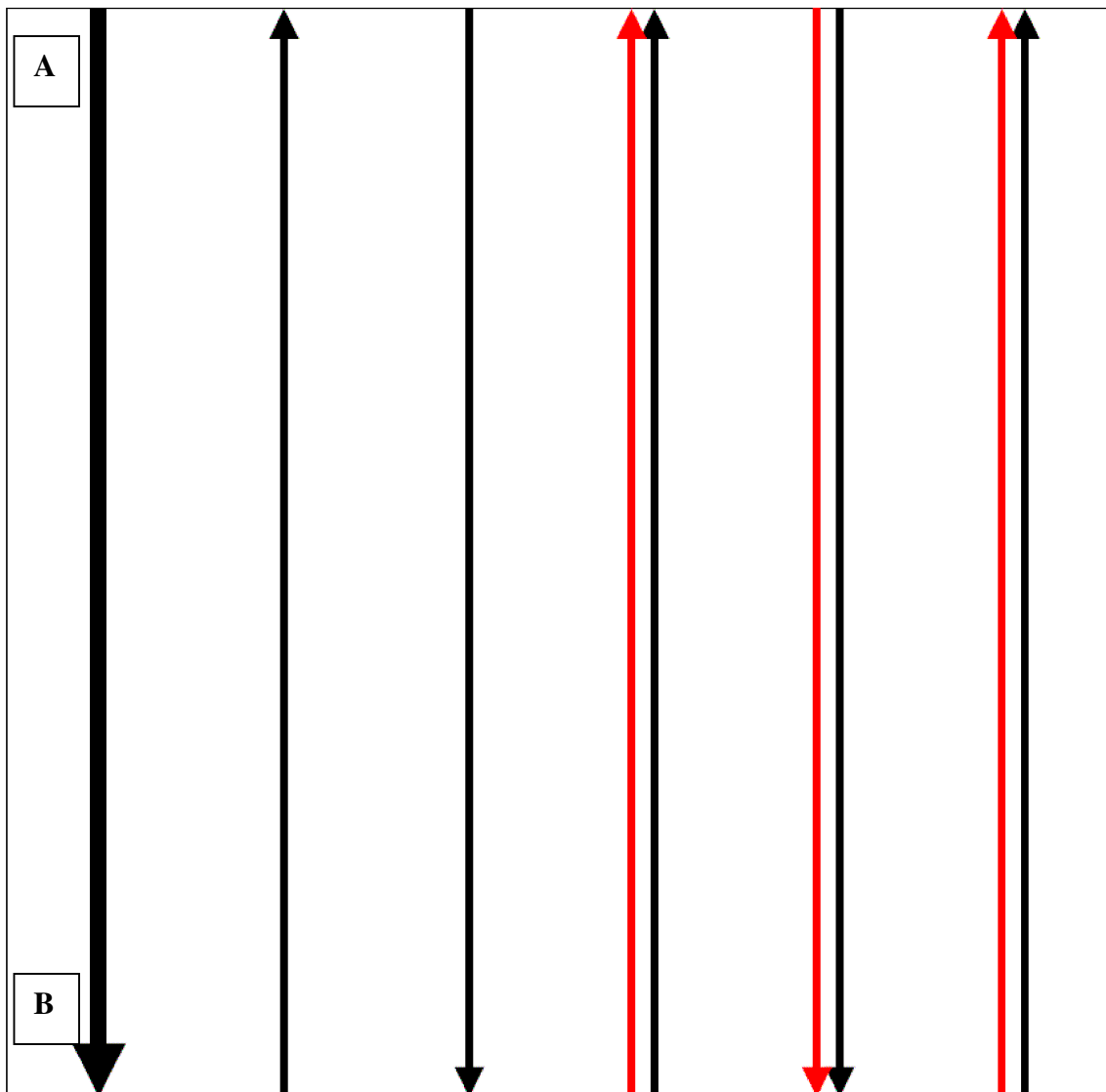
Q: What is Trim?

A: Trim is used for offset implements (implement draft). Example: Your implement trails off center to the left by two inches. You would use Trim to compensate for this. This is only used with RTK.

Q: What is Shift?

A: Shift is very similar to nudge. For example, if you plant your field and wish to come back later and side-dress N with an off set of 4 inches to the right of the row, you would use Shift to move your existing line four inches to the right. All following passes will be based off of the shifted AB line. The original AB line will not be overwritten or deleted and you have the ability to save the shifted AB line. This can be used with DGPS and RTK.